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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,205	08/07/2006	Gideon Kutz	SC13039/EI	3421
23125 7590 02/09/2009 FREESCALE SEMICONDUCTOR, INC. LAW DEPARTMENT 7700 WEST PARKER LANE MD:TX32/PL02 AUSTIN, TX 78729				
EXAMINER RIZK, SAMIR WADIE				
ART UNIT 2112		PAPER NUMBER		
NOTIFICATION DATE 02/09/2009		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USADOCKETING@FREESCALE.COM

### Office Action Summary

**Application No.**

10/596,205

**Applicant(s)**

KUTZ ET AL.

**Examiner**

SAM RIZK

**Art Unit**

2112

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 June 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/CICE)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date 6/2/2006, 8/7/2006

### **DETAILED ACTIONS**

- Claims 1-11 have been submitted for examination
- Claims 1-11 have been rejected

### **Specification**

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

1. The specification lacks the cross-reference to related applications section.

### ***Drawings***

2. Figure 3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. Sivan et al. US patent no. 6757701 teaches the same in figure 1. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim 1 is rejected under 35 U.S.C. 101 because the claim invention is directed to non-statutory subject matter.

Each limitation in the decoder (apparatus) claim 1 is an abstract algorithm that can be carried by computer software program element and is not tangibly embodied. For example a calculator for calculating the modulo of a linear approximation of a MAX\* function; and a selector for selecting a MAX\* output

value from the group  $a(n) \bmod F$ ,  $b(n) \bmod F$ , and the calculated modulo based upon a determination as to whether a predetermined threshold value for  $|a(n) - b(n)|$ , has been met, where  $a(n)$  is a first state metric,  $b(n)$  is a second state metric,  $C$  is the predetermined threshold value and  $F$  is a value greater than  $|a(n) - b(n)|$  whereby to enable the calculator to calculate the modulo of the linear approximation of the  $\text{MAX}^*$  function using a  $\text{mod}F$  function of  $a(n) \bmod F$ ,  $b(n) \bmod F$  and  $C$  are all mental steps that is not tangibly embodied in a hardware implementation. See MPEP § 2106.IV.B and *In re Schrader*, 22 F.3d 290, 295 (Fed. Cir. 1994).

4. Claims 2-8 depend from claim 1 and are rejected under 35 USC 101 for the same reasons as per claim 1.
5. Claim 9 is rejected under 35 U.S.C. § 101 because the claim invention is directed to non-statutory subject matter.

For Example, each limitation in the method claim 9, i.e. receiving a first modulo state metric  $a(n) \bmod F$ , a second modulo state metric  $b(n) \bmod F$  and a predetermined threshold value  $C$  for  $|a(n) - b(n)|$ , where  $F$  is a value greater than  $|a(n) - b(n)|$  whereby to enable the modulo of a linear approximation of a  $\text{MAX}^*$  function to be calculated using a  $\text{mod}F$  function of  $a(n) \bmod F$ ,  $b(n) \bmod F$  and  $C$ ; and selecting a value from the group  $a(n) \bmod F$ ,  $b(n) \bmod F$ , and the calculated modulo based upon a determination as to whether the predetermined threshold value  $C$  for  $|a(n) - b(n)|$ , has been met are pure mental steps or acts. To qualify under section 101 statutory process, the claim should positively recite the other

statutory class (the thing or product) to which the application is tied. See MPEP § 2106.IV.B and *In re Bilski* 88 USPQ2d 1385. and *In re Schrader*, 22F.3d 290, 295(Fed.Cir.1994).

6. Claims 10-11 depend from claim 1 and are rejected under 35 USC 101 for the same reasons as per claim 1.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
7. Claims 1 -11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sivan et al. US patent no. 6757701 (Hereinafter Sivan) and further in view of Kato et al. US patent no. 6922711 (Hereinafter Kato).
  8. In regard to claim 1, Sivan teaches:

- (Currently Amended) A decoder for a wireless communication device comprising:
  - a calculator for calculating the modulo of a linear approximation of a MAX\* function; and  
(Figure 4 in Sivan)
  - a selector for selecting a MAX\* output value from the group  $a(n)\text{mod}F$ ,  $b(n)\text{mod}F$ , and the calculated modulo based upon a determination as to whether a predetermined threshold value for  $|a(n)-b(n)|$  has been met, where  $a(n)$  is a first state metric,  $b(n)$  is a second state metric,  $C$  is the predetermined threshold value and  $F$  is a value greater than  $|a(n)-b(n)|$  whereby to enable the calculator to calculate the modulo of the linear approximation of the MAX\* function using a modF function of  $a(n)\text{mod}F$ ,  $b(n)\text{mod}F$  and  $C$ .

(Figure 3 and col. 5, lines (55-67) through col. 6, lines (1-22) in Sivan)

However, Sivan does not teach using modF function of an  $a(n)\text{mod}F$ ,  $b(n)\text{mod}F$  Kato in an analogous art that teaches approximate calculator for non-linear function and MAP decoder teaches;

- modF function of an  $a(n)\text{mod}F$ ,  $b(n)\text{mod}F$   
(col. 4, line (67) through col. 5, lines (1-15) in Kato)

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Kato that comprise using modF (mod2) function of  $a(n)\text{mod}F$ ,  $b(n)\text{mod}F$  with the teaching of Sivan.

This modification would have been obvious to one of ordinary skill in the art, at

the time the invention was made, because one of ordinary skill in the art would have recognized the need to calculate an approximate value of MAX\* without performing complex calculation using digital logic and or digital signal processing.

9. In regard to claim 2, Sivan teaches:

- (Original) A decoder according to claim 1, wherein the calculator is arranged to calculate the modulo of the linear approximation of the MAX\* function

using:  $(a(n) \bmod F + (((b(n) \bmod F - a(n) \bmod F) \bmod F) / 2 + C) \bmod F$ .

(col. 5, equation [5] in Sivan)

10. In regard to claim 3, Sivan teaches:

- (Original) A decoder according to claim 1, wherein the calculator is arranged to calculate the modulo of the linear approximation of the MAX\* function using:

$(((a(n) \bmod F + C) \bmod F / 2) + b(n) \bmod F) \bmod F + F * s]$  ' where s is equal to  $[a(m) \text{ XOR } b(m)] \text{ AND } [((a(m) \text{ XOR } a(m-1)) \text{ and } ((b(m) \text{ XOR } b(m-1)) \text{ and } a(m) \text{ b(m) } a(m-1) \text{ ) and } b(m-1) \text{ ) are the most significant bits of } a(n) \text{ b(n) } a(n-1) \text{ ) and } b(n-1) \text{ ) respectively.}$

(col. 5, equations [3] – [5] and lines (65-67) through col. 6, lines (1-20) and figure 3 in Sivan)

11. In regard to claim 4, Sivan teaches:



- (Currently Amended) A decoder according to claim 1, wherein the determination is based upon the sign of  $(a(n) \bmod F - b(n) \bmod F - C) \bmod F$  and the sign of  $(b(n) \bmod F - a(n) \bmod F - C) \bmod F$ .  
(col. 5, equations [3] – [5] and lines (65-67) through col. 6, lines (1-20) and figure 3 in Sivan)
12. In regard to claim 5, Sivan teaches:
- (Currently Amended) A decoder according to claim 1, wherein the selector is arranged to select and output the modulo of the linear approximation of the MAX\* function if the value  $|a(n) - b(n)|$  is less than the predetermined threshold value.  
(Figure 3 and col. 5, lines (55-67) through col. 6, lines (1-22) in Sivan)
13. In regard to claim 6, Kato teaches:
- (Currently Amended) A decoder according to claim 1, wherein the value of F is to the power of two.  
(col. 4, line (67) through col. 5, lines (1-15) in Kato)
14. In regard to claim 7, Sivan teaches:
- (Currently Amended) A decoder according to claim 1, wherein the selector is a multiplexer.  
(Figure 3, ref. (29) in Sivan)
15. In regard to claim 8, Sivan teaches:
- (Currently Amended) A decoder according to claim 1, wherein the calculator is an add module that is arranged to receive  $a(n) \bmod F$ ,  $b(n) \bmod F$  and C.

(Figure 3, ref. (24) in Sivan)

16. Claim 9 is rejected for the same reasons as per claim 1.
17. Claim 10 is rejected for the same reasons as per claim 2.
18. Claim 11 is rejected for the same reasons as per claim 3.

### ***Conclusion***

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- He et al. US publication 2003/0053556 teaches a method for efficient calculation of distance metric.

- Miyauchi US patent no. 6993703 teaches A decoder for performing log-sum corrections by means of a linear approximation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sam Rizk whose telephone number is (571) 272-8191. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Scott Baderman can be reached on (571) 272-3644. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronics Business Center (EBC) at 866-217-9197 (toll-free)

/Sam Rizk/

Examiner, Art Unit 2112